

SOLAR PANELS AND QUALITY:

# Inside Yingli Solar's Key Components



When choosing a solar panel, the options can be overwhelming.  
**We're here to help.**

This guide summarises the key components that are critical to solar panel quality.  
At Yingli Solar, quality is our top priority and our business is entirely focused on it.

[YINGLISOLAR.COM/AU](http://YINGLISOLAR.COM/AU)

# The Anatomy of a Solar Panel



The main components of a solar panel are outlined below. When looking for a reliable solar panel supplier, be sure to know where these materials are sourced!

## A Frame

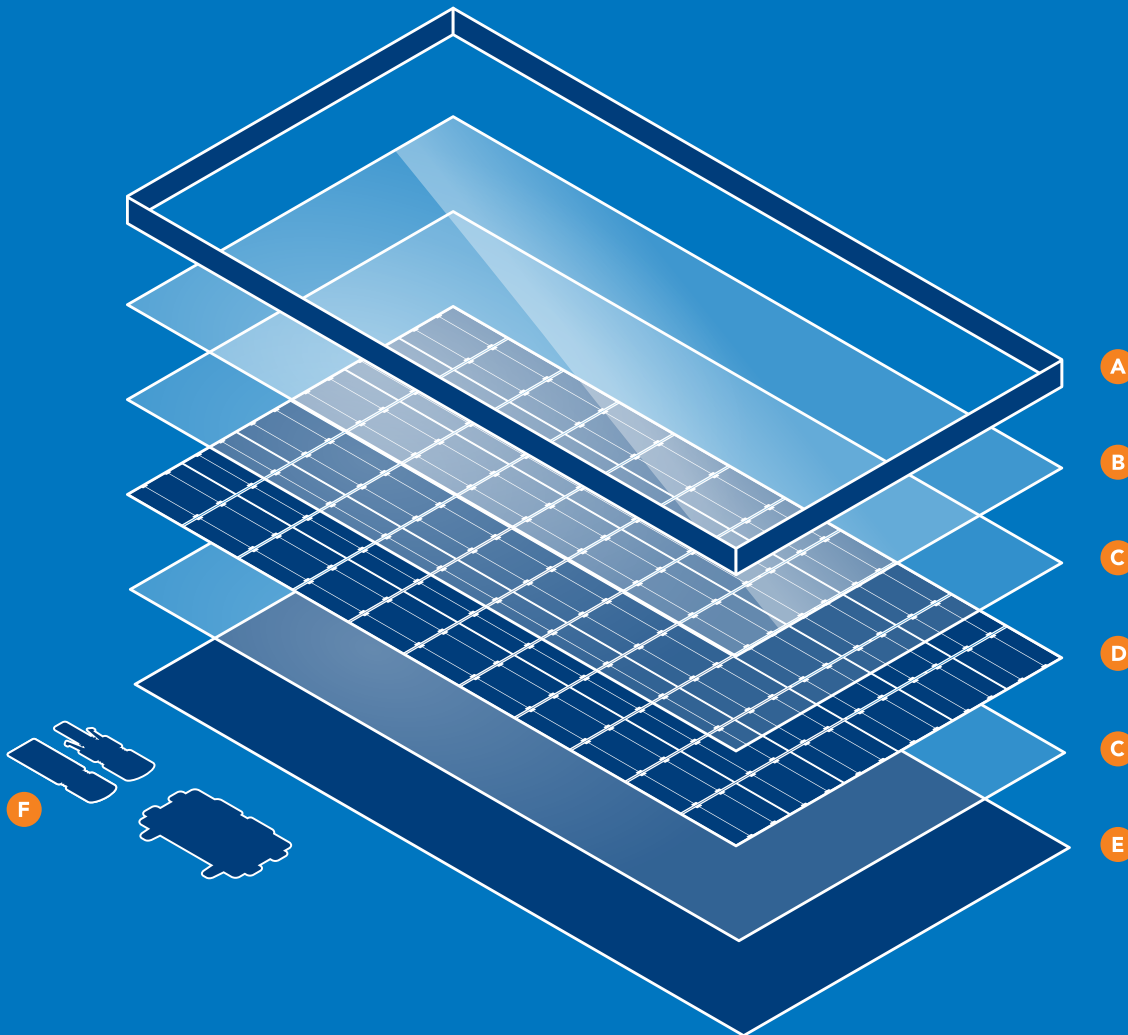
Made of anodised aluminum, the frame provides structural rigidity to the panel, protecting it from outdoor elements, and enables easy installation.

## B Glass

Glass protects the top-side of the panel while allowing an optimal amount of sunlight to reach the cells.

## C EVA (2 Layers)

Ethylene-vinyl acetate (EVA) is the glue that binds all the components of the panel together, and prevents water, dirt, and other elements from reaching the cells.



## D Cells

The engine of the panel, the solar cells are where sunlight is converted to electricity.

## E Backsheet

The back of the module is protected by an electrically-neutral backsheet that keeps water and dirt from entering the panel.

## F Junction/Connectors

The junction box transfers the electricity produced by the cells to the greater solar array via cables and connectors.

# Yingli Solar Panels are Designed to Perform



From glass to backsheet, our products are engineered to maximise energy yield, and deliver superior performance and durability.

Look inside a standard YGE Series panel to learn why.

## Frame

*Yingli's frames are designed and qualified in-house to provide structural integrity, durability, and easy installation.*

- Our frame research and development program employs aggressive static and dynamic load mechanical testing that far exceeds certification grade tests.
- Due to our frames' double-wall design, they are highly durable and can withstand static loads of 5400 Pa downwards and 2400 Pa upwards.
- We worked with our customers to design frames that are compatible with most mounting and grounding hardware, allowing for flexible array layouts and expedited installation times.
- Yingli frames are made from rust-resistant anodised aluminum that prevents corrosion in humid environments.





## Glass

*Yingli uses anti-reflective coated glass to increase energy yield.*

- By using highly textured low-iron glass with silicon dioxide anti-reflective coating, Yingli's panels can more effectively trap light and minimise soiling.
- Glass serves as the first line of defense against rain, hail, sleet, wind, and snow, so it must be thick enough to provide mechanical strength and rigidity.
- Our 3.2mm low-iron glass has been specifically chosen to ensure strength and prevent micro-cracks.

## EVA (ethylene-vinyl acetate)

*Yingli uses the industry's best-in-class EVA to improve all-weather performance, even in harsh climates.*

- EVA is the glue that binds solar panels together, and prevents water, dirt, and other elements from reaching the solar cells. If poorly-made EVA is used, yellowing and delamination can occur.
- Our EVA's low thermal resistance enables it to quickly dissipate heat from solar cells, which improves performance in hot environments and prevents overheating.

## Cells

*Yingli's high-performing solar cells are among the industry's best with efficiencies up to 18.1%.*

- Yingli manufactures solar cells in-house and understands every aspect that goes into a quality cell.
- We have rigorous quality controls and standards for suppliers. We conduct on-site quality inspections, as well as random third-party and in-house testing of both completed cells and panels.
- We were the first solar company with a full vertically integrated production line where we're responsible for every stage of the manufacturing process from turning raw silicon into finished solar modules.
- To increase power output, our cells (just like the glass!) are anti-reflective (AR) coated to trap more light. Every solar cell is electrically tested and carefully inspected to ensure quality and consistency in our products is enjoyed by all our customers.

## Yingli Solar: Quality Differentiators

World's largest solar panel manufacturer with proven experience deploying over 7 GW (as of Aug 2013)

Independent bankability assessments, technology reviews, and product certifications

World class in-house PV testing and reliability laboratories in USA, Spain and China

Best-in-class quality components and rigorous due diligence for suppliers

Industry's most advanced system performance modeling capabilities







## Backsheet

***Yingli proudly uses backsheets made with DuPont™ Tedlar® PVF film.***

- We only use fluoropolymer-based backsheets that are physically durable, and weather resistant to moisture, heat, UV light, and chemicals, because backsheets must protect and insulate the electrical circuitry of panels from the environment.
- Our backsheets also improve performance because their ultra-white surface reflects sunlight back towards the solar cells, increasing energy yield.
- Yingli works closely with DuPont, whose Tedlar® polyvinyl fluoride film set the PV industry standard for proven reliability and durability that continues today.

## Junction Box

***Yingli's panels are exclusively designed and produced with a fail-safe, weather-tight junction box to provide product reliability.***

- Yingli's junction boxes feature redundant sets of bypass diodes in order to improve reliability, and to minimise power loss from shading.
- With an ingress protection rating of IP67, our junction boxes are certified dustproof, and can withstand immersion in 1m of water for up to 30 minutes.
- Using the right junction box is critical to ensuring reliability. Our junction box, made by Yitong, is recognised by the industry for its exceptional design.

## Connectors

***Yingli uses state-of-the-art panel connectors from industry leaders Multi-Contact.***

- In Australia, Yingli Solar use MC4 connectors which are supplied by leading manufacturer, Staubli Group. *Amphenol Helios H4 connectors are also available upon request.*
- Multi-Contact connectors are highly reliable and provide efficient power transfer because their low electrical resistance minimises power loss.
- Each connector features quick, easy, code-compliant snap-lock mating.

# Are You Asking the Right Questions?

Not all panels are created equal. Asking your supplier a few simple questions can help steer you towards quality, reliable products.

## What type of backsheet do you provide?

Panels with backsheets made from standard materials are prone to yellowing and degradation, especially in harsh climates. Look for fluoropolymer backsheets and materials like Dupont™ Tedlar®.

## How durable are your frames?

Having the right frame can improve a panel's strength, while also reducing installation time and packaging costs. Ask your supplier how they qualify their frames. Do they go beyond industry standards?

## Who is your junction box supplier?

Junction boxes are among the most failure-susceptible of all panel components. It is imperative that suppliers have an established track record of success.

## Which connector supplier do you use?

Connectors can impact a panel's reliability and performance if they are not able to withstand high temperatures and humid conditions. Look for the industry leaders Multi-Contact.

Yingli Solar panels are designed, built, and proven to perform. As the world's largest solar panel manufacturer, quality is our top priority and our business is entirely focused on it.

DuPont™ and Tedlar® are registered trademarks of E.I. du Pont de Nemours and Company or its affiliates.

Yingli Green Energy Australia Pty Ltd  
australia@yinglisolar.com  
Tel: 1300 309 489

[YINGLISOLAR.COM/AU](http://YINGLISOLAR.COM/AU)

Our Partners:

